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CENTRAL INTELLIGENCE AGENCY

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WASHINGTON, D.C. 20505

7 September 1976

MEMORANDUM FOR: The Director of Central Intelligence

FROM : William W. Wells
Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): The Negotiation by Aviation of Enemy Air Defense Opposition in the Initial Operations of a War

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal 'Military Thought". This article contains two separate discussions of the role of aviation in negotiating enemy air defense. Following a description of the territorial and field air defense systems of NATO countries, the first focuses on three methods by which aviation may negotiate enemy air defense, assesses each of these and makes recommendations as to the advisability of their employment. The second concentrates on the problem of high losses to aviation from enemy air defense and ways to prevent them, and also discusses the establishment of flight corridors in the Western Theater of Military Operations. This article appeared in Issue No. 3 (79) for 1966. [redacted]

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2. Because the source of this report is extremely sensitive, this document should be handled on a strict need-to-know basis within recipient agencies. For ease of reference, reports from this publication have been assigned [redacted]

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William W. Wells

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Page 1 of 11 Pages

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Intelligence Information Special Report

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COUNTRY USSR

DATE OF INFO. Late 1966

DATE 7 September 1976

SUBJECT

MILITARY THOUGHT (USSR): The Negotiation by Aviation of Enemy Air Defense Opposition in the Initial Operations of a War

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 3 (79) for 1966 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article contains two separate discussions of the role of aviation in negotiating enemy air defense. Following a description of the territorial and field air defense systems of NATO countries, Colonel General of Aviation A. Mironenko focuses on three methods by which aviation may negotiate enemy air defense, assesses each of these and makes recommendations as to the advisability of their employment. He also includes the flight profiles and weapons to be employed for the successful use of aviation in fulfilling its tasks, emphasizing the need for the joint efforts of various branches and branch arms. Lieutenant Colonel T. Mezentsev concentrates on the problem of high losses to aviation from enemy air defense and recommends broadly allocating various forces and means to destroy enemy means in specified areas in order to prevent this. He also discusses the establishment of flight corridors in the Western Theater of Military Operations.

End of Summary

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Comment:

Colonel General of Aviation Aleksandr Alekseyevich Mironenko is currently identified as Commander of Naval Aviation. The SECRET version 50X1-HUM Military Thought was published three times annually and was distributed down to the level of division commander. It reportedly ceased publication at the end of 1970.

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The Negotiation by Aviation of Enemy Air Defense Opposition in the Initial Operations of a War

by
Colonel General of Aviation A. Mironenko
Lieutenant Colonel T. Mezentsev

The capitalist countries, joined in various military coalitions, are striving for maximum coordination of their efforts in air defense right to the point of rigid centralization of plans for its construction, allocation of forces and means, etc. The main attention in the development of air defense is devoted to increasing its efficiency, reducing its vulnerability, and improving control of forces and means for destroying air targets.

The territorial system of air defense has a widely developed system of radar observation as well as means of radio countermeasures and means of destroying aircraft and missiles, and these are allocated among zones, areas, and sectors with regard for important strategic targets located therein. In areas where ground forces are located, the territorial air defense is also expected to be reinforced by the means of the field air defense. The zone of combat operations of troops is viewed by the probable enemy as a single air defense entity.

For cooperation of the forces and means of the territorial and the field air defense, a joint air defense command of the theater of military operations is established. The field air defense is planned and organized on the basis of the decision of the combined-arms command. Air defense plans of armies are coordinated with the air defense plans of higher staffs and coordinated with the air defense plans of adjacent formations.

As a whole, the air defense of NATO countries in Europe is deeply echeloned, heavily saturated with radioelectronic means, fighter aviation, surface-to-air missiles and antiaircraft artillery, and it provides for successive, repeated employment of these forces and means against air targets. Much attention is also devoted to ensuring stability of carrier strike large units and surface ship groups, which do not, as is known, possess the capabilities for independently repulsing strikes of our aviation. In this connection, steps are being taken towards utmost utilization of the forces and means of the territorial air defense.

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Analyzing various exercises conducted in the last few years in military districts, fleets, among the Air Defense Forces of the Country and in long range aviation, one would conclude that for the aviation to negotiate the continental air defense, three methods are acceptable at the present time: negotiation of the air defense in a narrow sector of the front or in some designated area, negotiation of the air defense on a broad front, or negotiation of the air defense simultaneously in several areas along the entire front.

The advantage of the first method lies in the fact that it limits the capabilities of the enemy to offer opposition to the aviation with all (or even a major part) of the forces and means of air defense located in the zone of the front. Besides, in this case, it is possible to organize warfare against enemy radioelectronic means. The main disadvantage of the method is the necessity to increase the depth of the combat formation of aviation groups. And this leads to an increase in the duration of flight over enemy territory and consequently to a possible (but not always certain) increase in the time of action of the forces and means of the air defense against the combat formations of the aircraft.

The advantage of the second method consists chiefly in the fact that for the enemy the air situation is greatly complicated, while for our aviation the time of flight over enemy territory is shortened to the maximum and conditions for its maneuvering are improved. Thanks to this, it is possible to establish in flight the greatest density of combat formations. As for the disadvantages of this method, they come down to the need for dispersal of the forces of warfare against enemy radioelectronic means and, consequently, to forced violation of the principle of their massed employment. Besides this, during negotiation of the air defense on a broad front, the possibility of enemy action against the aviation with the greatest number of forces and means is increased.

The third method possesses the advantages of the first two and significantly fewer disadvantages. It limits the enemy capabilities for employing air defense forces and means, in particular for retargeting and massing them, etc. This method permits complete employment of the means of warfare against enemy radioelectronic means and does not require the employment of many supplementary forces and means to neutralize enemy air defense in the flight zones of aviation. But it requires significantly greater forces of aviation, which it is difficult to count on during the conduct of operations in a missile/nuclear war. Thus, the more acceptable are the first and third methods, which are chosen according to the availability of forces of aviation.

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But for these methods to be realized it is necessary to secure, through the joint efforts of fronts and fleets (with the most active participation of the various aviation branch arms: long range aviation, naval missile-carrying aviation, aviation of the Air Defense of the Country, etc.), to ensure the neutralization and destruction of enemy fighters, surface-to-air missiles and antiaircraft artillery, and radioelectronic means of detecting air targets and guiding fighters. These measures must to some degree or another be carried out by aviation at all stages of the flight routes through the enemy air defense zones. First and foremost in this regard, provision must be made for strikes of the rocket forces against the airfields where fighters are based, against radiotechnical means of observing the airspace, and against batteries of surface-to-air missiles and their fire control radars. For delivering strikes against the targets enumerated it is advisable to employ aviation as widely as possible but calculated so as not to weaken its forces specially allocated for operations against other important targets. In the first place, it is necessary to destroy and neutralize those air defense forces and means which are located in the flight zones of the strike aviation. It is desirable, if there is a capability, to widen these zones at least to the extent of the tactical flying radius of enemy fighters (figuring from the axis of the flight routes of the strike aviation).

Skilful execution of the measures enumerated is a necessary condition for successful employment of aviation. However, by carrying out these alone, it is impossible to reliably negotiate the air defense opposition. The correct selection of flight routes and profiles of the aircraft to the target and back as well as of combat formations of strike and tactical groups, and the systematic carrying out of anti-fighter and anti-missile evasive maneuvers will have enormous significance now as in the last war.

The flight route over enemy territory must, when possible, pass far from the home airfields of his fighters and places where means of detecting air targets are deployed, and outside of the kill zones of surface-to-air missiles. If conditions permit, it should be chosen over mountainous or sharply broken terrain, where the use of air defense forces and means is made difficult and in some cases even excluded. Moreover, in all cases it is advisable to set up flight routes on the boundaries of the guidance zones of fighters and the kill zones of surface-to-air missiles and antiaircraft artillery. This will significantly hinder enemy control of forces and means and consequently facilitate negotiating the air defense. Of course, in choosing the flight route it is necessary to consider also the capabilities of our rocket forces for destroying enemy air defense means. As regards the flight profile, it is necessary in choosing it to

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consider the following. High flight altitudes increase the radius of operation. At the same time they offer the enemy the most favorable conditions for detecting our aircraft and employing surface-to-air missiles, antiaircraft artillery and fighters against them (at a flight altitude of 10,000 to 11,000 meters, detection range of air targets by AQ/F-88 and AQ/F-247 radars is about 460 and 530 kilometers respectively). In addition, high altitudes (especially of flights at service ceiling altitudes) complicate anti-fighter and anti-missile evasive maneuvering.

Therefore, we will allow a high-altitude flight over enemy territory only to strike targets at a maximum distance from the departure airfields, and then only over terrain with a low saturation of fighter aviation and surface-to-air missiles, or where they are reliably neutralized. In individual cases (mainly in the absence of surface-to-air missiles and all-weather fighters in the flight zone) a flight at high altitudes over hostile territory may be carried out at night and under difficult weather conditions in the daytime.

Low-altitude flights are the most effective in negotiating air defense, in as much as in this case the detection range of air targets is significantly reduced (consequently the guidance of fighters against them and employment of other forces is made difficult) and the probability of their destruction drops sharply. Besides this, the use of guided missiles and surface-to-air missiles with nuclear warheads against low-flying aircraft is extremely limited. During flights at low altitudes the radius of operation of aviation is much reduced. True, this phenomenon is of a temporary nature. It is being eliminated with the entry into service of new engines. A more serious disadvantage is, perhaps, the difficulties arising in the technology of piloting and air navigation, especially at night and under difficult weather conditions in the daytime.

In our opinion, for the next three to five years the most advantageous profile (from the point of view of negotiating air defense opposition) is one which varies, providing for the use of high altitudes during the flight route and low ones in the area of strike delivery.

Success in negotiating air defense opposition depends to a large degree also on the combat formations of strike aviation. At the present time it is difficult to select a combat formation which would contribute to a full utilization of the flight-tactical capabilities of aircraft and at the same time ensure reliable covering by the means of warfare against enemy radioelectronic means, which would permit having high density of flight through zones of operation of fighter aviation, surface-to-air

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missiles and antiaircraft artillery, good defensive effectiveness and fire support capabilities of crews within the combat formation, and would also establish favorable conditions for fulfilling anti-fighter and anti-missile evasive maneuvers. In the final selection of combat formations, it is necessary to proceed not from a desire to satisfy all these requirements but to consider only those which exert the main influence on fulfilling the combat task.

So that a single missile with a nuclear warhead does not simultaneously destroy two or more aircraft, the distance between them in the combat formation must not be less than the radius of destruction of a guided missile or a surface-to-air missile. At the same time, this distance must not exceed the launch time interval of a surface-to-air missile (one minute on the average). But, unfortunately, such time intervals do not ensure the safety of crews during their flight through zones of radioactive contamination. (The flight crew can receive lethal doses of radiation.) Therefore, intervals and distances between aircraft have to be increased.

In contrast with the last war, it is necessary at the present time to carry out anti-fighter and anti-artillery (anti-missile) evasive maneuvers somewhat differently. In all cases, they must provide for maneuver against means of control and maneuver against fire (missiles), the former hindering the attack of enemy fighters as well as the allocation of targets among surface-to-air missile sites, the latter impeding the guidance of surface-to-air missiles against our aircraft. Along with carrying out anti-fighter and anti-missile evasive maneuvers, aircraft crews must also be prepared to conduct fire to destroy an attacking enemy.

Speaking of the methods of negotiating air defense opposition by aviation, it is impossible not to touch upon the special features of negotiating the air defense of ship groupings. Carrier strike large units (groups), large convoys and amphibious landing forces, have the strongest air defense which includes radiotechnical means of detection, fighter aviation, surface-to-air missiles and antiaircraft artillery. Observation of the air enemy is set up in a closed-ring system in near, intermediate and distant zones and is implemented by the radiotechnical means of the

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strike carriers, escorting ships, as well as special ships, submarines, and radar picket aircraft.*

Analysis of foreign exercises shows that at night and in the daytime under difficult weather conditions, only half of all the carrier-based aircraft covering a carrier strike large unit are able to put up opposition to strike aviation. With a sea state of five to six, this number is reduced by more than half. The practical intercept range of air targets by patrolling fighters at intermediate and high altitudes varies within the range of 220 to 300 kilometers from the ships, and with intercept from alert status on the carriers, 70 to 220 kilometers. Use of low altitudes by strike aviation reduces its intercept range from the ships by about one and a half times.

In an operation against ship groupings, aviation can negotiate air defense opposition from one or several directions, in a narrow or broad sector of course angles. Negotiating air defense opposition in a narrow sector of course angles (15 to 60 degrees) from several directions is the basic method, as it reduces the time of the strike aviation's being in the zone of operations of the air defense forces and means. With this method, destruction of radar picket ships and aircraft is, in all cases without exception, an indispensable condition of successful combat with the air defense. Taking into account the positioning of radar picket ships in carrier strike large units, one can reckon that in delivering a strike in a sector of 45 to 60 degrees it is necessary to destroy one or two of them, for which action is required by four to six missile-carrying aircraft.

It is advisable to carry out warfare against the radioelectronic means of ship groupings in stages as strike aviation enters the zones of operations of air defense forces and means. Diversionary operations (to cause premature launching of carrier-based fighters and diversion of their efforts to secondary axes) should, as a rule, anticipate the operations of the main forces. Here it is necessary to make every effort that this anticipation exceed the maximum possible duration of patrolling of the fighters. And finally, constant improvement of air-launched missile

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* Aircraft flying at altitudes of 7,000 to 10,000 meters are detected at a distance up to 370 kilometers from the center of a large unit of ships. At a flight altitude of 200 to 250 meters aircraft can be detected in the near zone at distances up to 80 to 110 kilometers, in the intermediate zone up to 600 kilometers, and in the distant zone up to 750 kilometers from a carrier strike large unit. It is also necessary to keep in mind that aerial observation in the distant zone is conducted by long-range radar detection aircraft and submarines only in designated sectors in a direction of threat.

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systems is also a necessary condition for increasing the effectiveness of combating the air defense.

* * *

Negotiating enemy air defense opposition in the first offensive operation is considerably complex for aviation, especially under the conditions of the Western Theater of Military Operations.

Calculations show that, given a probability equal to 0.6 of negotiating the enemy air defense, and under conditions where each aircraft must make two combat sorties a day, losses to aviation from the forces and means of air defense may, by the close of the second day of the operation, total about 80 percent of the original number of aircraft.

Incidental to this, in the first operation of a future war the sortie rate for combat actions of aviation will probably exceed two sorties per aircraft in 24 hours. This will naturally increase its losses. Therefore, for aviation to successfully fulfil the tasks assigned to it in the first offensive operation, it is necessary to ensure its probability of negotiating the air defense within the range of 0.8 to 0.9. Attaining this is possible only by destroying enemy air defense means and, first of all, the Hawk and Nike batteries in the zone of combat operations of the air army of the front. For this it is necessary to broadly allocate the rocket troops, artillery, tanks, and air army of the front. And this, undoubtedly, requires the seeking of more improved forms of combat employment of these forces and means.

We also come to the conclusion that practically it is impossible to destroy all air defense installations in the zone of the offensive of a front to the full depth of an operation. Therefore, it is necessary to limit ourselves to the destruction and neutralization of the air defense in certain areas where the most active operations of our aviation are contemplated. In some exercises, neutralization of air defense in designated zones has been practiced, which established corridors* for the flight of aircraft to strike targets. Calculations show that it is desirable to establish such a corridor for aviation operations at altitudes less than 1,000 meters. (In this case the necessity of destroying Nike-Hercules surface-to-air missile batteries does not arise.)

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* By a "corridor" for the flight of aircraft is meant a space over enemy territory limited in width, length (depth), and altitude, and located out of effective range of surface-to-air missile fire.

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In establishing a corridor for the flight of aircraft at altitudes of 5,000 to 10,000 meters, the number of batteries which have to be destroyed is almost doubled.

For the conditions of the central part of the Western Theater of Military Operations, it is advantageous to establish, instead of one corridor at altitudes of 5,000 to 10,000 meters, two corridors at altitudes to 1,500 meters, as the number of surface-to-air missile batteries it is necessary to destroy and neutralize is about the same in the one case as in the other. Special attention should be given to the terrain over which the corridor is established. It is more advantageous to have it over terrain where it is more difficult or utterly impossible to deploy surface-to-air missile batteries, in areas of swamps, lakes, or mountains.

During its planning the width and depth of the corridor must be coordinated with the capabilities of the front for destroying surface-to-air missile batteries, since, depending on the width and depth of the corridor as well as on the flight altitudes of aircraft in it, the number of surface-to-air missile batteries to be destroyed will vary from ten to 63 batteries (with a width of the corridor from one to 30 kilometers, a depth of 200 kilometers, flight altitudes of aircraft from 1,000 to 10,000 meters, and under ordinary and complex weather conditions).

Thus, in the specified situation, the most advisable method of negotiating the air defense in the first offensive operation is the establishment of corridors.

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